UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/751,756	12/29/2000	Robert A. Marshall	062891.0451	5059

			EXAMINER
5073	7590	07/13/2006	JAMAL, ALEXANDER

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ART UNIT	PAPER NUMBER
2614	.

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Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/751,756	MARSHALL ET AL.
	Examiner	**Art Unit**
	Alexander Jamal	2614

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>26 April 2006</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-3,5-14 and 16-26</u> is/are pending in the application.

    4a) Of the above claim(s) <u>13</u> is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-3,5-12,14 and 16-26</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   Based upon the submitted amendment (4-21-2006), the examiner notes that claim 13 has

been cancelled and claims 1,11,16,18,19 have been amended.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

3.   **Claims 1,3-6,11-17** rejected under 35 U.S.C. 103(a) as being unpatentable over Erreygers

(6236664), and further in view of Liu (6088385).

As per **claim 1,** Erreygers discloses a method of providing greater reach for a

DSL signal comprising a step of receiving, processing, then transmitting an incoming

DSL signal including a data signal (ABSTRACT). Erreygers further discloses that the

repeater comprises two ADSL transceivers (Fig. 3: Col 5 lines 40-60) to process the bi-

directional data signal. However, Erreygers does not specify that the transceivers

perform demodulating, requantizing, modulating, and then amplifying the data signal.

Liu teaches an ADSL transceiver with a flexible and scaleable rate (ABSTRACT,

Col 1 lines 30-45). Liu's transceiver performs the functions of demodulating received

analog signals and producing the original data stream 201 (Fig. 2). It also takes the

received digital data stream and quantizes then modulates the stream to produce a DSL

signal (output of block 230). Examiner reads the demodulation of the data signal as

'conditioning the data signal to aquire underlying data' because the original data stream

is recovered and used to requantize the signal. With two transceivers in series in the

repeater disclosed by Erreygers, the repeater will performs the functions of demodulating,

requantizing, modulating, and then amplifying the received signal (in both directions).

The received data is requantized first by ADC 280 (Fig.2), then demodulated by DMT

core 260. The act of demodulating the signal comprises the step of requantizing the data

to recover orginal data stream 201 (the original data is demodulated by comparing the

received signal to a true value constellation, removing the carrier signals and making a

judgement with each received data bit to the known true value constellation, then using

the judgement to assign the recognized original data bit into another true value

constellation where the original data stream is communicated to the rest of the system, for

example, if the signaling is in binary, the data bits will be assigned (requantized) to either

a '1' or a '0'. The DMT RX core 260 or control interface must make a decision on the

value of each bit (a true value of a true value constellation) in order to produce the data

stream 201, and then assign (requantize) each recovered original data bit to another true

value constellation (such as '1' and '0' for binary). When the original data stream is

passed to the second ADSL transceiver (disclosed by Erreygers Fig.3), the data signal is

sent to be modulated by DMT core 150 (LIU: Fig. 2) where each data bit is set to a known 'true value' constellation. The remodulated signal is further requantized by DAC 230 as the DAC determines what true value analog voltage should be output as represented by the already requantized, remodulated, and regenerated signal being input into DAC 230 It would have been obvious to one of ordinary skill in the art at the time of this application to utilize Liu's transceiver for each of the transceivers in series disclosed by Erreygers for the purpose of implementing flexible and scaleable transceivers in the receiver that may have greater compatibility with various types of ADSL transceivers at either the CPE side or central office side of the network.

As per **claim 11,** claim rejected for same reasons as rejection of claim 1.

As per **claims 16,17,** claim rejected for same reasons as rejection of claim 1. Erreygers and Liu disclose the means (the transceiver) to perform the method of the claim 1 rejection.

As per **claims 3,12,** Liu discloses that the ADSL transceivers perform the steps of digitizing the data, using an FFT to demodulate the data in the Frequency bins (subchannels in a DMT system) (Col 6 lines 1-10, 34-54) (Col 8 lines 1-10). Since the demodulation is setup to only demodulate data from specific sub-channels (bins), the data outside the bins is inherently discarded.

As per **claim 13,** claim 13 rejected for same reasons as claim 1. The decoded data is recoded (requantized, each bit set to a value in a constellation).

As per **claims 5,14,** Erreygers, in view of Liu discloses that the DSL repeater decodes the data using frequency bins and an FFT (as per rejection of claim 3) and then recodes the data into frequency bins, and converts the signal to an analog signal (Liu Fig. 2). However, they do not specify using an inverse FFT.

It would have been obvious to one of ordinary skill in the art at the time of this application to utilize an inverse FFT to recombine the data that was decoded via an FFT for the reason that the inverse FFT will provide the most efficient, and accurate means to recombine data that was separated via FFT.

As per **claim 6,** Liu's system requantizes the data in the frequency domain (the sub-channels) (Col 8 lines 1-15).

4.   **Claims 18-25** rejected under 35 U.S.C. 103(a) as being unpatentable over Erreygers (6236664), and in view of Liu (6088385), and further in view of McGhee et al. (6658049).

As per **claim 18,25,** claim 18 is disclosed by Erreygers in view of Liu for the same reasons as the rejections of claims 1 and 16. However they do not specify the DSL signal includes a voice signal that is combined (in the repeater) with the amplified data signal.

McGhee discloses an xDSL repeater system where the DSL signal comprises a

voice and data signal (Col 3 lines 28-30). The voice signal is filtered, and then combined

with the amplified/repeated data signal (Fig. 2). Both the Data and Voice signals are

amplified by the gains of filters 32 and 34 (Fig. 2). It would have been obvious to one of

ordinary skill in the art at the time of this application to provide means to

split/recombine/amplify the voice and data signals after being processed by the repeater

for the purpose of allowing the repeater to be used on DSL lines that contain both data

and voice signals.

As per **claim 19,21,24,** claims rejected for the same reasons as claim 18 rejection.

Additionally, Liu discloses a first signal detector (Hybrid 220 in Fig. 2) (Col 6 lines 9-14)

that detects the incoming DSL signal from the telephone line and applies the outgoing

DSL signal to the line. A first conditioning unit is described in claim 1 rejection.

Erreygers in view of Liu discloses two transceivers in parallel to implement a Bi-

directional repeater (Erreygers Fig. 3) that comprises a second signal detector and

conditioning unit working in the opposite direction as the first signal detector and

conditioning unit.

As per **claim 20,** McGhee discloses high band filter 34 and low band filter 32

(Fig. 2) to separate the voice and data signals.

As per **claims 22,23,** Erreygers, in view of Liu in view of McGhee discloses that

the DSL repeater decodes the data using frequency bins and an FFT (as per rejection of

claim 3) and then recodes the data into frequency bins. The transceiver further comprises

A/D and D/A converters (Liu Fig. 2). However, they do not specify using an inverse

FFT.

It would have been obvious to one of ordinary skill in the art at the time of this

application to utilize an inverse FFT to recombine the data that was decoded via an FFT

for the reason that the inverse FFT will provide the most efficient, and accurate means to

recombine data that was separated via FFT.

5.   Claims 2,7,8, rejected under 35 U.S.C. 103(a) as being unpatentable over Erreygers

(6236664), and in view of Liu (6088385) as applied to claim 1, and further in view of McGhee et

al. (6658049).

As per **claims 2,7,** Erreygers in view of Liu discloses applicant's claim 1,

however they do not specify the DSL signal includes a voice signal that is combined (in

the repeater) with the amplified data signal.

McGhee discloses an xDSL repeater system where the DSL signal comprises a

voice and data signal (Col 3 lines 28-30). The voice signal is filtered, and then combined

with the amplified/repeated data signal (Fig. 2). It would have been obvious to one of

ordinary skill in the art at the time of this application to recombine the voice and data

signals after being processed by the repeater for the purpose of allowing the repeater to be used on DSL lines that contain both data and voice signals.

As per **claim 8,** McGhee discloses that the first filtered portion of the DSL signal comprises the voice portion in the 0-4 KHz range and the remaining portion (such as approximately 25KHz to 1.1 MHz) is used for the ADSL signal (Col 1 lines 45-60).

6.   **Claims 9,10** rejected under 35 U.S.C. 103(a) as being unpatentable over Erreygers (6236664) in view of Liu (6088385) as applied to claim 1, and further in view of Fisher (4878232).

As per **claims 9,10,** Erreygers in view of Liu discloses applicant's claim 1. However, they do not specify that the repeater signals are coupled to the telephone line (both transmit and receive signals) by a balanced, resistive, hybrid bridge.

Fisher discloses using a resistive hybrid bridge to couple transmit/receive data signals to/from a transmission line (ABSTRACT, Fig. 4) (Col 3 lines 25-60). It would have been obvious to one of ordinary skill in the art at the time of this application to implement a resistive hybrid bridge for the bridge specified in Liu as a matter of design choice (for example, resistor based circuits take up less space than inductors).

7.   **Claim 26** rejected under 35 U.S.C. 103(a) as being unpatentable over Erreygers (6236664), in view of Liu (6088385), in view of McGhee et al. (6658049) as applied to claim 19, and further in view of Fisher (4878232).

As per **claim 26,** Erreygers in view of Liu in view of McGhee discloses

applicant's claim 19. However, they do not specify that the repeater signals are coupled

to the telephone line (both transmit and receive signals) by a balanced, resistive, hybrid

bridge.

Fisher discloses using a resistive hybrid bridge to couple transmit/receive data

signals to/from a transmission line (ABSTRACT, Fig. 4) (Col 3 lines 25-60). It would

have been obvious to one of ordinary skill in the art at the time of this application to

implement a resistive hybrid bridge for the bridge specified in Liu as a matter of design

choice (for example, resistor based circuits take up less space than inductors).

Response to Arguments

1.   Applicant's arguments with respect to claim 10-27-2005 have been considered but are

moot in view of the new ground(s) of rejection. Examiner submits the following responses to

applicant's arguments.

As per applicant's arguments (remarks, pages 9-11) that the Erreygers-Liu

combination does not disclose requantizing the data by resetting each bit to a bit of a

constellation, examiner disagrees. Examiner notes the new rejection to claim 1 (and the

other independent claims) in order to explain the multiple places where requantizing with

a true value constellation is taking place in the disclosed prior art system. Again,

examiner notes that the Liu transceiver functions to recover the original data stream

(which inherently comprises assigning received signal values to a true value constellation

for the purpose of recovering the original data) from a received modulated signal.

As per applicant's arguments concerning dependant claims, 2-7,12-15,17, 9-10,26 examiner maintains the rejection on them for the same reasons as their independent claims.

As per applicant's arguments (remarks page 12) of lack of motivation to combine Liu and Erreygers, examiner contends that providing more flexible transceivers (the adaptive data rate transceiver taught by Liu) in the ADSL repeater taught by Erreygers (as mentioned in the previous office action) is a valid motivation to combine the references.

As per applicant's arguments (remarks page 12) of lack of motivation to combine Liu and Erreygers and McGhee, examiner contends that the motivation specified in the prvious office action (and maintained) is a valid motivation because it increases network capacity and saves costs.

As per applicant's arguments (remarks page 13) of lack of motivation to combine Liu and Erreygers and Fisher examiner contends that the motivation specified in the previous office action (and maintained) is a valid motivation because it increases network capacity and saves space. Examiner maintains that Fisher teaches a well known circuit structure with an advantage inherent to resistors (space savings over alternate circuits such as inductors) that would obviously have been implemented as the unspecified hybrid function disclosed by Liu.

2.   Applicant's amendment necessitated the new ground(s) of rejection presented in this

Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

       A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this

final action.

       Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Alexander Jamal whose telephone number is 571-272-7498. The

examiner can normally be reached on M-F 9AM-6PM.

       If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Curtis A Kuntz can be reached on 571-272-7499. The fax phone numbers for the

organization where this application or proceeding is assigned are **571-273-8300** for regular

communications and **571-273-8300** for After Final communications.

AJ
June 27, 2006

CURTIS KUNTZ
SUPERVISORY PATENT EXAMINER
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